# KAB
# Souvenir EQS MK12
# Stereo Disc Remastering Phono Preamp

## 1. Introduction.

The KAB EQS MK12 is a full-featured phono preamp intended for use in the remastering and restoration environment. It is equally at home with audiophiles and serious collectors. Like an electronic encyclopedia of disc recording, the Souvenir EQS MK12 decodes and translates the many different response curves and recording techniques employed from the earliest cylinders to modern day vinyl. Like all KAB products the EQS MK12 embodies features and design standards ordinarily found in more expensive gear.

The heart of the EQS MK12 is the KAB exclusive chronologic EQ which features 12 de-emphasis curves presented along a historical time line. Standardized curves are identified by their official terms. The individual stereo curves are selected via a custom 12 position interlocked switch array. This approach makes selecting and auditioning different curves very easy.

The EQS MK12 features multiple inputs and outputs to appeal to the professional and audiophile alike. The audiophile for instance, can use the second send loop to "send" hi quality audio to a separate AUX input. This output comes directly off the class A gain stages and precedes the process section. The final output can then be used to gain access to the process section, while high quality vinyl follows a minimal signal path.

The Process section features a steep rumble filter, Vertical/Lateral translator, Stereo/Mono switch with Mix Control and the second process loop switch. The adjustable gain lets you set the output between -12 and +15dB. Referenced to the 36 / 56 dB nominal gain of the preamp.

The single rack enclosure is of steel construction. Circuit highlights include glass epoxy double-sided circuit boards, low noise precision metal film resistors, 2% propylene film capacitors, multiple propylene bypass capacitors, and gold Teflon® hand wired RCA connectors.
The design features KAB class A Polar Stable™ topology with power-up preconditioning. The unit features full RFI/EMI filtering and cascaded power supply regulation.

### Scanning the front panel presents the following functions:

1. **Phono Selector**. Choose from 2 turntables.
2. **Cartridge Resistive Loading**. Left half for MC cartridges. Right half for MM cartridges.
3. **+20 dB.** For Moving Coil Cartridges. Warning: **Set this switch before turning the unit on. Or push line in first to mute, change gain, wait 10 seconds, and release the line in button.**
4. **Line In.** Insertion point between first gain stage and EQ networks.
5. **KAB Chronologic Equalizer**. Choose the EQ curve that corresponds to the record your playing. Refer to the Curve Selector Chart for guidelines and recommendations.
5. **Effect Loop.** Insertion point between second gain stage and processing section.
6. **Rumble Filter**. Steep 24dB/Oct filter; corner frequency is 30 Hz.
7. **Vertical/Lateral**. Permits translation between vertical cut and lateral cut (modern) recordings.
8. **Stereo/Mono**. Selects between stereo and mono sound.
9. **Mono Mix**. Active when Mono is selected. Permits blending left and right groove wall for best sound.
10. **Gain**. Allows for adjusting output gain from -12dB to +15 dB above and below the nominal 36/56dB.

# 2. Getting Connected.

### Scanning the rear panel presents the following connections:

1. **Phono Ground Terminal** Connect turntable ground wires here
2. **Phono 1** Connect one turntable here
3. **Phono 2** Connect second turntable here

A note about turntable wiring, the cable used for turntables differs from that used for interconnecting line level equipment. The cable used should be flexible not stiff, have good shielding and feature low capacitance. Try to obtain the capacitance per foot of this cable for you will need to know the total capacitance loading the cartridge. For best response, this should never exceed the Mfr rated limit.

4. **Line In** Return Only. Connect an unequalized line level source here or to mute when changing gain.
The return line is driving directly into the EQ curves which represent a 2000 ohm load. This can be a difficult load to drive for most home audio gear. An optional Line Driver card is available to improve performance here. This input is primarily useful for processing line level flat transfers.

5. **Effect Loop** Send/Return Connect a signal processor here.
The send line can drive 2000 ohm load easily. The return line is driving into a unity gain buffer. Input impedance is 50K ohm. ***The #2 Send connectors can be considered Very High Quality outputs since the signal here passes only through the front end gain stages and passive EQ.*** This loop is a good place to insert dedicated devices like graphic or parametric Equalizers.

6. **Final Output RCA** Connect to line level input on your stereo or the next device in your processing chain.
The output level can be adjusted using the front panel gain control.
This output is capable of driving 600 ohms easily.

7. **Final Output Active Balanced TRS** Connect to TRS balanced inputs.
The output level can be adjusted using the front panel gain control.
This output is capable of driving 600 ohms easily.

8. **Power In 28 VDC** Use supplied power transformer only.
A word about safety, the unit is operated from a dedicated 28VDC power pak. The power pak meets all the standard safety requirements.

**NEVER SUBSTITUTE THE POWER PAK.**
**There are no user serviceable parts inside**

# 3. Initial Setup.

## Turn the unit on.

For Low Output MC Cartridges, set the +20dB switch before powering up the unit.
Note that there will be a 10 second delay before sound can pass through the unit.
Relays short-circuit the outputs during this period. At this time, the amplifiers stabilize and the coupling components are preconditioned. When the relays open they are effectively removed from the signal path. Sound does not pass *through* the relays.

## Set cartridge loading.

### Capacitance

This value is fixed. There are 2 values. For resistive loads of 25 to 1000 ohms it is 650 pF.
For resistive loads of 10K to 100K it is 100 pF. Remember that these values are added to the cable capacitance of your turntable for total cartridge loading.

### Resistance

Check the cartridge specifications and adjust the setting accordingly.
Most MM and high output MC cartridges use 47K Ohms. Low output MC's use 100 Ohms.
***Note: with moving magnet cartridges, lowering the resistance below the recommended valued will roll off the treble response. With vintage material, one might tinker with this to achieve a simple noise filter.***

## Choosing a curve.

The Chronologic Equalizer follows a unique time scale. If you know the approximate age of the disc you are playing, you can simply "test" the curves in that era and settle on the one that sounds right to you. If you have a newer disc and can identify the curve as a standard one, then select it by name. If still in doubt, go through the selection chart and find the label and corresponding curve. The differences in some of the more modern curves are subtle, yet in an audiophile environment, these subtleties can make big differences. What we are trying to achieve in selecting a curve is *spectral balance*- a kind of unity between the bass, midrange, and treble.

## Process Section

### Rumble Filter

The rumble filter will remove all low frequency disturbances below 30 Hz. It has a steep 24 dB/Oct rate of attenuation. Without losing deep bass, the filter will clean up sub sonic nasties. Especially useful on 78's since many of these tend to have rumble induced from the primitive cutting machines.

### Vertical / Lateral

Some vintage discs are cut with a vertical groove where modulation moves the stylus up and down. Compare this with the current method, lateral, where the stylus moves side to side. Pressing the Vertical button inverts the left channel only. Now, press the mono button. You're now hearing the vertical movement of the stylus. You might even find this useful when playing stereo recordings. In a stereo recording, the vertical information usually consists of the ambience and reverb cues.

# 3. Initial Setup Cont'd.

## Process Section Cont'd

**Mono / Stereo**
Use to select either mono or stereo mode.

**Mono Mix**
When a mono recording is played with a stereo phono cartridge, the left and right channels conform to the two independent walls of the groove.
Whenever mono is selected, the Mono Mix control is engaged. Turning this control full left produces the left channel only; full right produces the right channel only. When the control is in the center, both sides of the groove wall are mixed together equally. The purpose of the control is to get the cleanest sound by finding the "true" center. Groove wear and pressing defects often skew the setting in favor of one side or the other. Use the Vertical function simultaneously to get a null, and then switch back to lateral.

## Gain
When set to 0, the unit has two nominal gains based on the setting of the +20dB switch. 36dB and 56dB. Always set the +20dB switch before powering up the unit. Set the gain control as required.

## Loop 1
This line level input is located just after the first class A gain stage but before the EQ Section.
Push Loop 1 to engage the source connected here.

## Loop 2
The second process loop is located just after the second class A gain stage but before the Process Section.
Push Loop 2 to engage the loop.

## White Buttons
White key caps are used on the buttons that can cause major changes to the sound output. **+20dB, Flat EQ, Mono and Vertical /Lateral.** If you should suddenly notice something unusual about the sound, check these buttons first. Remember to only set the +20dB switch with the power off.

## Black Buttons
Black key caps are used for the EQ curves. Exception is RIAA which is GREEN and Flat which is white.

## Gray Buttons
Gray key caps are used for process features, line in and the phono input selector.

# 4. EQ Curve Chart (Records made from 1900 and 1955)

| 78 RPM | | LP's | | LP's | |
|---|---|---|---|---|---|
| Label | Setting | Label | Setting | Label | Setting |
| Acoustics | AC or AE | Allegro | LP | Oceanic | LP |
| Blue Bird | AE, E5, NAB | American Rec Soc | AES | Oxford | LP |
| Brunswick | AE, E3, CO | Angel | AES | Odeon | E3, RIAA |
| Capitol | AES, RIAA | Atlantic | NAB | Okeh | E3, RIAA |
| CBS | E3, CO, NAB | Bach Guild | LP | Parlophone | E3, RIAA |
| Columbia | AE, E3 | Banner | LP | Period | LP |
| Continental | E3, CO | Bartok | LP | Philharmonia | AES |
| Coral | NAB,RIAA | Boston | LP | Polydor | E3, RIAA |
| Decca | E5, NAB, RIAA | Blue Note | AES | Rachmaninoff | LP |
| ffrr | AE, E3 | Caedmon | AES | RCA Victor | RIAA |
| Deutsche Gr. | E3, CO | Capitol | AES | Remington | LP |
| Electrola | E7, AES | Canyon | AES | Stradavari | LP |
| Good Time Jazz | E3, CO | CapitolCetra | AES | Telefunken | E3 |
| Gramophone | A3, E3 | Colosseum | AES | Radiofunken | E3 |
| Harmony | AE, E3, CO | CetraSortia | LP | Ultraphone | E3 |
| Hit of theWeek | E5 | Columbia | LP | Urania old | LP |
| H.M.V. | E7, AES | Concert Hall | AES | Urania new | AES |
| King | NAB, RIAA | Contempory | AES | Vanguard | LP |
| London | E7,RIAA | Coral | AES | Vox | LP |
| Lyrichord | LP | Cook | LP | Westminster | LP |
| Majestic | LP | Decca ffrr | ffrr | Vitaphone | LP |
| Melotone | E3, CO | Dial | LP | | |
| Mercury | AES | Electra | LP | | |
| MGM | AES | EMS | AES | Musicraft | RIAA |
| Okeh | AE, E3, CO | Esoteric | AES | | |
| Polydor | ffrr | Festival | LP | | |
| **Victor** | | | | | |
| VE(Oval) | AE | Handel Society | LP | | |
| VE(Diamond) | E5 | Hayden Society | LP | | |
| New Ortho | RIAA | HMV | E7 | | |
| Sittin' in with | NAB | London | E7 | | |
| Schirmer | NAB | Mercury | AES | | |
| Supraphone | AE, E5 | MGM | AES | | |
| Technichord | E5, RIAA | Montilla | AES | | |
| Ultraphone | E5, RIAA | Musicraft | RIAA | | |
| Velvet tone | AE, E3 | New Records | LP | | |

## Postscript

After 1955 it is believed that most recordings use the RIAA curve. It is wise to test the other modern curves to satisfy yourself that RIAA is correct. Certainly by 1965 RIAA was locked in.

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# 5. Specifications

## Input Section

**Input Capacitance**: 100/560 MM/MC
**Input resistance**: 100 - 100K Ohm 12 steps
**Input Sensitivity**: 15 mV (@1000Hz, RIAA, for 1Vrms)
**Input Overload**: 91 mV- MM, 9mV - MC (@1000Hz, RIAA for 5.7Vrms Out)
**Fixed Front End Gain**: 36dB or 56dB(@1000Hz, RIAA, Gain set to 0)

## Chronologic Equalizer

(All curves computed using S. Lipshitz landmark AES paper. Vol 27, #6 June 1979 and data compiled from the Radiotron Designer Handbook and empirical data)

| Curve | f3 | f4 | f5 | LF Gain Stop |
|---|---|---|---|---|
| AC | 50 | 500 | 5000 | YES(+10dB)1/ |
| AE | 20 | 200 | 2120 | NO |
| E3 | 30 | 300 | 2120* | NO |
| E5 | 50 | 500 | 2120* | NO |
| E7 | 70 | 700 | 2120* | NO |
| CO | 30 | 300 | 1590 | NO |
| NAB | 40 | 400 | 1590 | YES(+17dB)1/ |
| LP | 50 | 500 | 1590 | YES(+13.5dB)1/ |
| AES | 40 | 400 | 2500 | NO |
| ffrr | 30 | 300 | 2120 | YES(+17.5dB)1/ |
| RIAA | 50 | 500 | 2122 | NO |
| FLAT | 0 | 0 | 0 | NO (Gain Fixed) |

* High Frequency roll-off is KAB fine slope technique 3dB/Oct.. Shelving at -10dB
1/ Low Frequency gain stops limit the total bass boost to the figure stated. Ref 0 dB @ 1000 Hz.

## Rumble Filter

**Corner Frequency**: 30 Hz.
**Attenuation**: 24 dB/Oct.

## Output Stage

**Active Balanced TRS**: 10 Vrms Max
**RCA Single Ended**: 5 Vrms Max

## Distortion & Noise (Ref 1 Vrms out)

**THD** < 0.05%
**IMD** < 0.05%
**S/N** -92dB MM, -74dB MC

## Physical Specifications

Dimensions: (w x h x d)19" x 1.75" x 8.25"
Weight: 7 Lbs.
Shipping weight: 10 Lbs.

## Company Address

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